NORTHNAVFACENGCOM

FIRE PROTECTION DESIGN REVIEW CHECKLIST

REV 2.0 (10/98)

NOTE: This checklist provides a recommended framework for the Fire Protection Engineering Quality Review Process. This checklist shall not be submitted as a substitute for a narrative Fire Protection Engineering Design Analysis. It may be submitted as an appendix to the narrative design analysis, if desired. Obviously, not all fire protection requirements are listed herein. Designers and reviewers must consult the actual criteria documents while using this checklist.

PART I - GENERAL REQUIREMENTS

(This part is applicable to all new construction, addition, and whole-building renovation projects.)

TOPIC:	REFERENCE:
1. CONSTRUCTION AND HEIGHT & AREA LIMITS	
a. Provide description of function(s) performed in the building:	UBC, Table 3-A HDBK 1008, App. A
_____	
_____	
b. Classify building occupancy Group(s) and Division(s) per UBC:	UBC Table 3-A _____
c. State gross floor area:	_____
d. State height in stories & feet (m):	_____/_____ft(m).
e. For existing buildings, state Construction Type and Sub-Type, determined from UBC based on actual construction of building:	UBC, Table 6-A Section 601-606 Type:_____
f. For new construction/additions, determine building Construction Type and Sub-Type per UBC, based on the allowable height and area for the occupancy.	UBC Tables 5-B&6-A, Chapter 5 and Mil-HDBK 1008
	Type:_____
Determine basic allowable area from UBC:	_____

Apply UBC-allowable area or height increases as appropriate per UBC.	Sect. 504 _____ X Sect. 505 .	
	Total Allowable Area:_____	
Show hourly ratings of all fire rated assemblies on drawings. Indicate on drawings UL, FM, or other nationally recognized testing laboratory approved assembly reference number(s) to allow NORTHDIV to verify the fire rating of assemblies.	_____	
g. For renovations or additions to an existing building, is occupancy permitted in that construction type?	_____	UBC Sec 504-508, HDBK-1008
Will final height and area be within UBC limits for the type of construction and occupancy?	_____	
If not, explain in detail remedial actions proposed to bring the finished building into compliance with the code.	_____	
h. If a building has mixed occupancies, determine required interior separation per UBC and NFPA 101. Show		UBC Sect 302 Table 3-B, NFPA 101, Ch. 6

hourly ratings of all fire rated assemblies on drawings. Indicate on drawings UL, FM, or other nationally recognized testing laboratory approved assembly reference number(s). _____

i. Determine if automatic sprinkler system or other fire suppression system is required. HDBK-1008, NFPA 101, UBC, Other Criteria _____

2. BUILDING SEPARATION & EXPOSURE PROTECTION

a. Determine required separation between new bldg and existing bldgs and other hazards Per UBC Sect. 503 and Table 5-A based on fire resistance of bldg exterior. Use DM-22 for separation from POL tanks. **NOTE: Table 5-A lists the building-to-property line distance! For bldgs on Gov't property, assume an imaginary property line between them and increase the distances in Table 5-A accordingly.**

Exterior Wall Rating: ___

Wall Opening Protection: ___

Separation Distance Req'd: ___

b. Determine type of roof deck assembly and roof covering allowed per HDBK-1008.

Covering (pph 2.9.1) Class:_____

Deck (pph 2.9.2) FM Class:_____

c. Is access provided for fire HDBK 1008, pph 2.11

apparatus around building? _____

3. OCCUPANCY

a. Are all spaces/rooms on plans identified to indicate usage and contents. Provide a legend if abbreviations are used. _____

b. Are all borders between mixed occupancies shown? _____

4. FIRE WALLS, FIRE AND SMOKE PARTITIONS

a.	Area fire walls must separate building into areas not exceeding the maximum floor area allowed.	UBC, SECS. 505 & 506 Table 5-C HDBK-1008 _____
b.	Determine fire wall ratings from UBC and HDBK 1008. Use NFPA 101 for ratings of means of egress.	_____
c.	Show all wall, floor, and roof ratings on drawings. Include UL or FM design #'s.	_____
d.	Is parapet required on fire wall?	HDBK-1008, UBC _____
e.	Show doors in rated walls as self-or automatic-closing and of appropriate label and rating.	HDBK-1008, NFPA 101 _____
f.	Ensure all vertical stairs and shafts are properly enclosed by fire rated construction.	HDBK-1008, NFPA 101 _____
g.	Ensure hazardous areas are properly enclosed by rated construction. (See NFPA 101 occupancy chapter Section x-3.)	NFPA 101 _____
h.	Provide corridor fire resistance rating if required. Use NFPA 101, not UBC.	NFPA 101 _____
i.	Ensure fire doors and windows are of proper rating and shown on door/window schedules.	NFPA 101, UBC, HDBK-1008_____
j.	Ensure rated doors and windows are in labeled frames.	NFPA 80 _____

k.	Ensure proper door hardware (self-closers, automatic closers, latches, etc.) is specified and shown on door schedule.	NFPA 101 NFPA 80 _____
l.	Provide automatic dampers in ducts passing through rated partitions where required. (Generally > 1 hour.)	NFPA 90A NFPA 101, Ch 6 _____
m.	Determine if smoke barriers are required. (e.g. health care.)	NFPA 101, 6-3 _____
m-1.	Doors and dampers protecting openings in smoke barriers must be self-closing or automatic-closing by smoke detector activation.	NFPA 101 _____

5. MEANS OF EGRESS/LIFE SAFETY

a.	Classify occupancy(ies) per Life Safety Code.	NFPA 101, Ch. 4 _____
b.	Determine Occupant Load Factor from Life Safety Code	NFPA 101, Sect. 5-3 _____
c.	Determine occupant load by dividing floor area by Occupant Load Factor. Calculate this for each floor or area, and sum for total load.	NFPA 101, Sect. 5-3 _____
d.	Determine the minimum required number of exits from every area.	NFPA 101, Sect. 5-4 _____
e.	Determine Egress Capacity for each approved component of the means of egress per the Life Safety Code.	NFPA 101, Sect. 5-3.

Stairs: _____in(cm)/person

Level Components and Ramps: _____in(cm)/person

f.	Determine minimum required width of each egress component by multiplying egress capacity factor by the occupant load (number of people) served by the egress component.	NFPA 101, Para 5-3.3.1 _____
g.	In addition to the calculation performed in (e) above, does each component of egress meet the required absolute minimum width?	NFPA 101, Para 5-3.4 _____

h.	Determine the maximum allowable travel distance to the nearest exit.	NFPA 101, Table A-5-6.1 _____
	State the maximum *designed* travel distance to nearest exit and its location.	_____
i.	Determine the maximum allowable dead end distance.	NFPA 101, Table A-5-6.1 _____
	State the maximum *designed* dead end and its location.	_____
j.	Determine the maximum allowable common path of travel.	NFPA 101, Sect. 5-6, and Occupancy Chapter _____
	State the maximum *designed* common path of travel and its location.	_____
k.	Are exits remote from one another as required? (Use diagonal rule.)	NFPA 101, Sect. 5-5 _____
l.	Are exit components (stairs, ramps, etc.) approved for the particular occupancy?	NFPA 101, Ch. 5 and Occupancy Chapter _____
m.	Do stairs and ramps comply with dimensional requirements?	NFPA 101, Sect. 5-2 _____
n.	Do exits and stairs discharge directly to the outside or through a protected passageway when required?	NFPA 101, Sect. 5-7 _____
o.	Do doors swing in the direction of exit travel when required?	NFPA 101 5-2.1.4 _____
p.	Does door hardware (locks, latches, hinges, etc.) comply with Life Safety requirements?	NFPA 101 5-2.1.5 _____
q.	Is panic hardware provided where required (schools, assembly, child care)? (Consult OPNAVINST 1700.9D for CDCs)	NFPA 101 5-2.1.7 And Occupant Ch. _____
r.	If fire or smoke doors are likely to be kept open by occupants, are smoke-detector actuated automatic-closers provided?	NFPA 101 5-2.1.8 NDIV FPEDG _____

s.	Ensure exit paths are not through hazardous or lockable rooms.	NFPA 101, Sec. 5-5.2 _____
t.	Is normal illumination provided in egress?	NFPA 101, Sec 5-8 _____
u.	Is emergency lighting provided where required?	NFPA 101, Sec. 5-9 _____
v.	Are battery-type emergency lighting units wired to the circuits serving lights in corresponding areas?	N.E.C.(NFPA 70) Art. 700-12, NDIV FPEDG. _____
w.	Are illuminated exit signs provided?	NFPA 101, Sec. 5-10 _____
x.	Are exit signs provided with battery back-up?	NFPA 101 5-10.3 NDIV FPEDG _____
k.	Is interior finish material limited to Class A in exits, sleeping rooms and correctional facilities and and in compliance with NFPA 101 elsewhere? Are plastic finishes prohibited?	HDBK-1008, 2.7 _____
n.	Is floor carpet properly specified?	HDBK-1008, 2.7 _____
o.	Is insulation properly specified? Does it comply with flame and smoke ratings?	HDBK-1008, Sec. 2.7 _____

6. WATER SUPPLY

a.	Ensure building has an adequate water supply.	
b.	Determine fire flow demand. (Provide copies of calculations.) _____ GPM, at _____ PSI	HDBK 1008,Sec. 5.3, 5.4
c.	Conduct hydrant flow test. Determine from test:	NDIV FPEDG, NFPA 291
	1. Static pressure.	_____
	2. Residual flow and pressure.	_____
d.	If pressure and/or flow is inadequate, provide appropriate correct-	HDBK 1008, Sec. 5.6, 5.7

	ive measures (reinforce distribution system, provide booster fire pump, or provide storage tank and pump.		_____
e.	Conduct flow test before 35% submission.	NDIV FPEDG	_____
f.	Provide adequate number of hydrants.	HDBK-1008, Sec. 5.7.3	_____
g.	Ensure Hydrants are at least 50 feet from the buildings they protect.	HDBK-1008, Para 5.7.3, NDIV FPEDG	_____
h.	Provide adequate sectional valves in any additions to the distribution system.	HDBK-1008, Para 5.7.2	_____

PART II - FIRE PROTECTION SYSTEMS

(This part applies only to those systems required or used on the project. It is not necessary to complete sections on systems not used.)

1. FIRE ALARM AND DETECTION SYSTEMS

(Use NFGS 13852 or **N-**13855 **NORTHDIV REGIONAL SPEC.**)

a.	Is a system required? If so, what type? (Required for all buildings with 100 or more occupants, and as required by NFPA 101.)	NDIV FPEDG HDBK-1008, Sec 7.2, 7.3	_____
b.	Provide manual stations at each exit and intermediate locations where required.	NFPA 101,Paras 7-6.2.3 and 7-6.2.4, NDIV FPEDG	_____
c.	Make manual stations handicapped-accessible.	NDIV FPEDG ADAAG	_____
d.	Automatic detection (generally only for life safety in sleeping occupancies or protection of high-value electronics.)	HDBK-1008, Sec 7.3, NDIV FPEDG	_____
e.	Do not locate smoke detectors where subject to false alarms (janitor's closets, laundries, mechanical rooms, toilet rooms, kitchens, and unfinished concealed spaces such as crawl spaces and attics.). If detection in this rooms is needed, indicate heat detectors.	NDIV FPEDG	_____
f.	Duct smoke detection: Follow NFPA 90A, coordinate with HVAC specifications. Specify HVAC shutdown on any alarm from fire alarm system.	NFPA 90A, Ch 4, NFPA 101, Para. 6-3.5, NDIV FPEDG	_____
g.	Control panel (w/ integral annunciation) shall be located in an accessible place such as the entrance. **NOT IN MECHANICAL OR ELECTRICAL ROOM!**	NDIV FPEDG	_____
h.	Is the master box located in an	NDIV FPEDG	

accessible place outside the main entrance on the building wall, preferably at a location protected from precipitation? ____

2. EXTINGUISHING / SUPPRESSION SYSTEMS

2.1 Sprinklers REQUIRED: YES NO (circle one)

(NFGS-13930 Wet Pipe)
(NFGS-13935 Dry Pipe)
(NFGS-13940 Deluge/Preaction)

a. Make sure coverage is 100%. (Include electric and phone closets). HDBK-1008 6.1.4.2 ____

b. Determine sprinkler occupancy type (ordinary or extra) and group. HDBK-1008, Appendix C

Hazard: _____

Group: _____

c. Is system to be hydraulically calculated? HDBK 1008, 6.1.4.1 ____

d. For hydraulic calcs, specify occupancy group, design density, remote design area, and hose stream allowance. HDBK-1008, Sec. 5.1, Table 5.1.2 ____

e. For pipe schedule systems, specify occupancy group as above and delete density, design area, and hose stream allowance from specification. ____

f. If storage occupancy, indicate specific class of commodity stored, how it is stored (i.e., piles, pallets, racks), and storage height. NFPA 231,231C

CLASS: _____

STORAGE METHOD: _____

STORAGE HEIGHT: _____

f-1. Are in-rack sprinklers required? NFPA 231C ____

h. Is riser detail provided showing Fire Department connection, alarms, alarm valve or dry pipe valve, OS&Y, and drains? ____

i. Is underground feed main at NDIV FPEDG

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	least 6" size? Is depth of bury IAW NFPA 24?		____
j.	If water source is nonpotable, is this clearly stated on drawings?	NDIV FPEDG	____
k.	Is automatic power shutdown provided for electronic equipment?	NFPA 75, NDIV FPEDG	____
m.	Is the Fire Department connection accessible to the fire dept. from paved surface?		____
m-1.	Is there a fire hydrant within 150'of the fire department connection?	HDBK 1008 5.7.3.2	____
n.	Does the sprinkler system activate the building fire alarm?	HDBK-1008 6.1.1 & 7.2.1	____
o.	Does the sprinkler system send an an alarm to the Fire Department?	HDBK-1008 6.1.4.3	____
p.	Are sprinkler and fire alarm specs coordinated (i.e., flow switch under sprinkler section and wiring to alarm system under fire alarm section)?		____
q.	Are PIVs at least 40 feet from the buildings they control?	NFPA 24, 3-3.2	____

2.2 <u>Carbon Dioxide Systems</u> REQUIRED: YES NO (circle one)

NFGS-13961 High Pressure C02
NFGS-13962 Low Pressure C02

a.	Is CO_2 required? (Electronics rooms and underfloor areas; water-reactive HAZMAT hazards)	HDBK-1008, Secs 4.8, 6.6 NDIV FPEDG	____
b.	Are all areas/zones to be protected clearly indicated on dwgs?.		____
c.	Are all openings sealed or protected with self or automatic-closing assemblies.	NFPA 12, 2-2 NDIV FPEDG,	____
d.	If system is actuated by smoke detectors, are detectors cross-zoned with the proper sequence of operations.	NDIV FPDEG,	____
e.	Are both automatic and manual acti-	NDIV FPEDG	

vation means provided? ____

f. Are pre-discharge and discharge alarms shown and specified?

g. Is CO_2 initiation and control system shown in the same level of detail as the fire alarm system on the one-line riser diagrams? ____

h. Are the interconnections between CO_2 control panel, fire alarm control panel and HVAC controls shown on the one-line riser diagrams? ____

i. For multiple hazards, is the CO_2 system arrangement shown (i.e., separate supplies; common supply with zone selector valves, etc.) ____

2.3 Wet Chemical Systems For Range Hood Protection

(NFGS-13971, NFPA 17) REQUIRED: YES NO (circle one)

a.	Required for cooking equipment such as deep fat fryers, open griddles, char-broilers, and hood/plenum areas. (Note: Protection for duct only may be deleted if approved grease extractor is in the duct.)	NDIV 4042, G.1 NFPA 96, Para 7-1	____
b.	Provide manual and automatic activation.	NDIV 4042 G.1, G.4	____
c.	Show manual stations near an exit and distinct from stations used for the building alarm and other extinguishing systems.	NDIV 4042, G.4	____
d.	Indicate automatic fuel or power shut-down.	NFPA 96, Para 7-3.1.3	____
e.	Show connection to building alarm. If no building alarm, connect directly to the base fire alarm system or to the Fire Department, if possible.	NDIV 4042, G.2	____

2.4 Foam Systems REQUIRED: YES NO (circle one)

For Haz/Flam Facilities: HDBK 1008, NFPA 30, NFGS-15358
For Aircraft Hangars: HDBK 1008, NFPA 409, NFGS-15356
For Storage Tanks: HDBK 1008, NFPA 11, NFGS-15357

For Storage Tanks:

a. Determine application rate. NFPA 11,Ch 3 ____

b. Determine foam duration time. NFPA 1, Ch 3 ____

c. Determine # of supplemental hose streams NFPA 11,Ch 3 ____

d. Calculate required foam quantity NFPA 11,Ch 3 ____

e. Determine number of foam makers NFPA 11,Ch 3 ____

For Aircraft Hangars:

a. For all projects, use wet pipe sprinklers or single interlocked overhead pre-action sprinklers activated by rate compensated heat detectors and manual pull stations.

b. Sprinkler heads must be 175 deg. F, Quick-Response type.

c. Heat detectors, if used, must be 165 deg. F.

d. Low level nozzles must be activated by cross-zoned UV/IR or triple-spectrum IR optical fire detectors and by manual stations.

e. For Air Force projects, follow AFM 88-15. ____

f. With the exception of the above, follow NFPA 409. ____

For Haz/Flam Storage, Transfer & Disposal Facilities:

a. Follow Mil-Hdbk-1008, Mil-hdbk-1032/2, NFPA 30, other criteria as directed by NORTHDIV

3. STANDPIPES

Mil-Hdbk-1008 (SECT. 6.4), NFPA 14, NFGS-N-13975

a. Provide in every stair tower of buildings 4 stories or more, connected to fire department pumper connection. HDBK-1008, Sec. 6.4____

b. Is the standpipe dry or wet? (Is it subject to freezing?) ____

c. Are the Fire Department connections accessible? ____

d. Is there a fire hydrant within 150' of HDBK-1008

the fire dept. pumper connection? _____

e. 2 1/2" valved outlets without hose located as required by NFPA 14? _____

Are pressure reducers required at lower floors due to high static or residual pressure? (Avoid if possible.) _____

f. Is the standpipe properly sized (attach calculations) per NFPA 14? _____

4. FIRE PUMPS

(NFGS 13920, NFPA 20)

a. Must be diesel-powered unless electric power is supplied from two independent sources. NDIVFPEDG _____

b. Are controllers spec'd as UL/FM listed, standard products (Not custom built). NFPA 20 _____

c. Are remote Pump Running and Supervisory alarms sent to fire Dispatch per NFPA 20, 7-4.7 & 9-4.3? NFPA 20 7-4 & 9-4 _____

e. Spec special anti-corrosion alloys for salt water pumps? NDIVFPEDG _____

f. Are both test header and flow meter properly shown on the drawings? NDIVFPEDG _____

5. FIRE EXTINGUISHERS

(NFGS N10520, NFPA 10)

a. Are cabinets to be provided? Consult NTHDIV FPE _____

b. Are extinguisher locations shown on drawings? _____

c. Are extinguishers properly spaced per NFPA 10? NFPA 10, Ch 3: _____

d. Are extinguishers Government or contractor furnished? If contractor furnished, specify type(s) and UL Consult NTHDIV FPE _____

ratings.

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